

Shoreland Mitigation Handbook

for Barron County, Wisconsin



Background

Development and human activity around the shores of Wisconsin waterbodies has negatively impacted water quality, near-shore aquatic habitat, upland wildlife habitat, and natural scenic beauty.

What is Mitigation?

Mitigation is a way to restore the important natural functions of the lakeshore which have been lost through development and human activities. Mitigation can be preserving or restoring a natural landscape or installing a feature on a property that helps lessen the negative impacts that human activity and development have on water quality of nearby waterbodies and the natural functions of the shoreland ecosystem.

What are some natural features and functions of a healthy shoreland ecosystem?

Vegetative buffers filter stormwater which carries pollutants (i.e. sediment, nutrients, chemicals), provide critical habitat for near-shore aquatic animals and upland wildlife, slow down and cool down stormwater coming off of impervious surfaces heated by the sun, stabilize the soil to prevent erosion of the bank caused by runoff or wave action, and provide natural scenic beauty.

Uncompacted soils have a high rate of stormwater absorption which then filters down to recharge the groundwater supply rather than running off which can lead to flooding, erosion, and release of pollutants into waterbodies.

Wetlands act as storage areas for stormwater (flood control), provide critical habitat for aquatic species and other wildlife, filter and purify stormwater that is carrying pollutants after rain events, and provide natural scenic beauty.

When is Mitigation required?

A Mitigation Plan is required before the Zoning Office can issue a Land Use Permit for the following activities:

- Increase of **impervious surface** within 300' of the ordinary high water mark (OHWM) of a waterbody which results in 15% - 30% total impervious surface as described in Section 17.41(7)(d) of the Barron County Ordinance.
- **Lateral expansion** of a nonconforming principal structure within 75' of the OHWM (200 sq. ft. addition max. allowed) as described in 17.41(9)(c).
- **Relocation** of a principal structure that is within 75' of the OHWM as described in 17.41(9)(e).
- A shoreland activity that is granted by the Board of Adjustment through a variance. As a **condition of approval**, the Board may require mitigation, if the activity is occurring within the shoreland setback.

When do the mitigation practices need to be completed?

All mitigation practices must be completed/installed within 1 year of issuance of the associated Land Use Permit. The practices must stay in place and be maintained by the current property owner and all subsequent property owners thereafter.

What types of mitigation practices can be done to complete a Shoreland Mitigation Plan?

On page 2 is a catalog of the mitigation practices, and their point values, that are available for completing a Shoreland Mitigation Plan. **3 points are required** to satisfy the plan.

MITIGATION OPTION CATALOG (3 points required)	
Type of Mitigation Practice	Number of Points
(1) Update or replace a non-compliant Sanitary System	2
(2) Preserve or restore a vegetative buffer zone that extends 35 feet landward from the ordinary high water mark (OHWM). (Must be native plants)	2
(3) Preserve or restore a vegetative buffer zone that extends 50 feet landward from the OHWM. (Must be native plants)	3
(4) Viewing and Access Corridor width of 15 feet or less	1
(5) Install a rock infiltration trench or pit	Up to 3 points
(6) Install a rain garden with native plantings, or similar feature	Up to 3 points
(7) Preserve or restore both shoreland sideyard areas with native plants	1
(8) Remove or relocate a building or impervious structure, which is located within the shoreland setback, to a compliant location.	1 point for each structure

The most important components are a site plan and a written plan which provides all pertinent details to show that the chosen mitigation practices will meet the standards to earn the proposed mitigation points. The following documents/forms must be completed and submitted to the Zoning Office for review:

- [illegible]

Shoreland Mitigation Handbook
Barron County Zoning

Explanation of Mitigation Options

(1) Update or replace a non-compliant Sanitary System

Intent: A non-compliant Private Onsite Wastewater Treatment Systems (POWTS) could potentially be releasing effluent into the soil which percolates into groundwater and possibly the nearby waterbody. Updating/replacing a non-compliant system to make it code compliant will insure that the wastewater from the home is being properly treated and filtered before it reaches the groundwater and potentially the nearby waterbody.

Points Earned: 2 mitigation points

Description/Requirements: Upon discussion with Zoning staff, if it appears that the system may be non-compliant, the landowner would be advised to hire a Master Plumber, Master Plumber Restricted Sewer, or a POWTS Maintainer to conduct a detailed evaluation of the system and submit a Barron County Sanitary System Evaluation Form to the Zoning Office for review. (In some cases, if it is determined by Zoning staff that the system is quite certainly non-compliant, the requirement to get the system evaluated may be waived). If after review, the evaluation determines the system to be non-compliant, the landowner can go forward with the process for having a licensed plumber design and install a new POWTS. In order to obtain the mitigation points, the State Sanitary Permit for the new system must be issued before the Land Use Permit is issued. The new POWTS must be installed within 1 year of Land Use Permit issuing date.

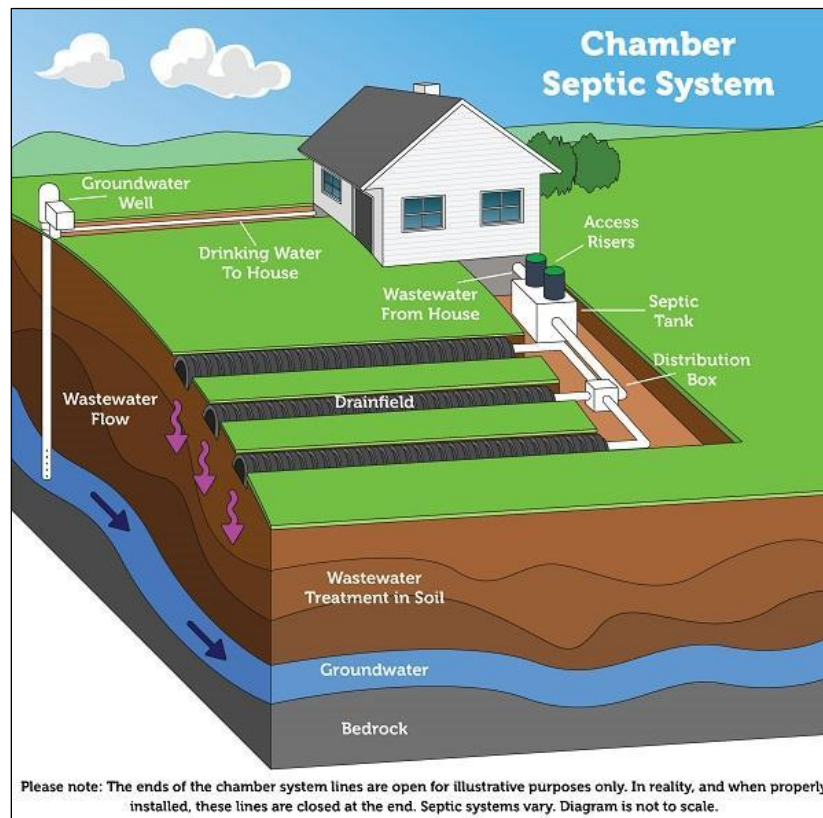


Figure 2: Compliant conventional septic system with leaching chambers.
(www.epa.gov)

(2) Preserve or restore a vegetative buffer zone that extends 35 feet landward from the ordinary high water mark (OHWM). (Must be native plants)

Intent: An intact vegetative buffer zone has many functions and provides many benefits for the health of the nearby waterbody, aquatic life, wildlife and for users of those waterbodies. Some of the functions and benefits of the buffer zone are cleaning/filtration of stormwater carrying pollutants which flow downhill towards the waterbody, provides near-shore habitat for wildlife, and creates natural screening between the waterbody and structures on the lot.

Points Earned: 2 mitigation points

Description/Requirements: A vegetative buffer zone is an area that extends landward from the OHWM of a waterbody a specified distance (35 feet in this case) and extends the entire width of the lot, with the exception of the viewing and access corridor that passes through the buffer to the waterbody. In this part of Wisconsin, the vegetative buffer zone must be densely covered with the 3 distinct layers of vegetation which is comprised of plants that are native to Wisconsin, and should be void of non-native/invasive species. The 3 layers of vegetation that must make up the buffer are a tree canopy layer, shrub (or tree seedling/sapling) layer, and a ground cover (i.e. grasses, forbs, ferns) layer. In order to receive 2 mitigation points, an existing compliant buffer can be preserved, or if there is not a compliant buffer on the lot currently, it can be restored/replanted. When determining if an existing buffer is sufficient or when restoring/replanting a vegetative buffer, it shall be in accordance with the standards contained in the USDA – Natural Resource Conservation Service (NRCS) guidance document [Wisconsin Biology Technical Note # 1 – Shoreland Habitat](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/biology/?cid=stc001). In general, the vegetation within the buffer zone must be left untouched, with the exception of certain removal and maintenance situations as established in Section 17.41(6) of the Barron County Land Use Ordinance. Note that rather than a 30 foot wide viewing/access corridor as mentioned in the NRCS document, the current allowable width for the viewing/access corridor is actually 35% of the lot width/water frontage.

- Website link to *Wisconsin Biology Technical Note # 1 – Shoreland Habitat*: <https://dnr.wi.gov/topic/ShorelandZoning/documents/NRCSBioTechNote.pdf>
- Native Plant List (WI DNR) website link: <https://dnr.wi.gov/files/pdf/pubs/nh/nh0936.pdf>

(3) Preserve or restore a vegetative buffer zone that extends 50 feet landward from the OHWM. (Must be native plants)

Points Earned: 3 mitigation points

Description/Requirements: The vegetative buffer zone follows the same standards as mentioned in Option # 2 above, except 3 points can be earned rather than 2 if the buffer extends 50 feet or more landward from the OHWM.

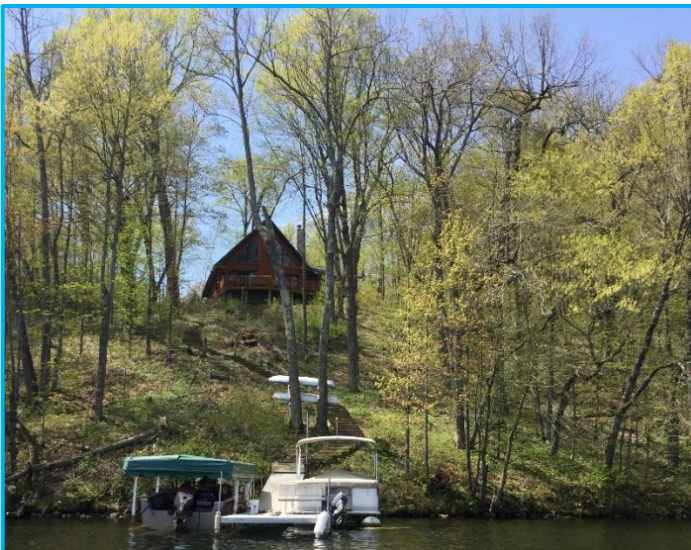


Figure 3: Existing native buffer zone & view corridor (County photo)

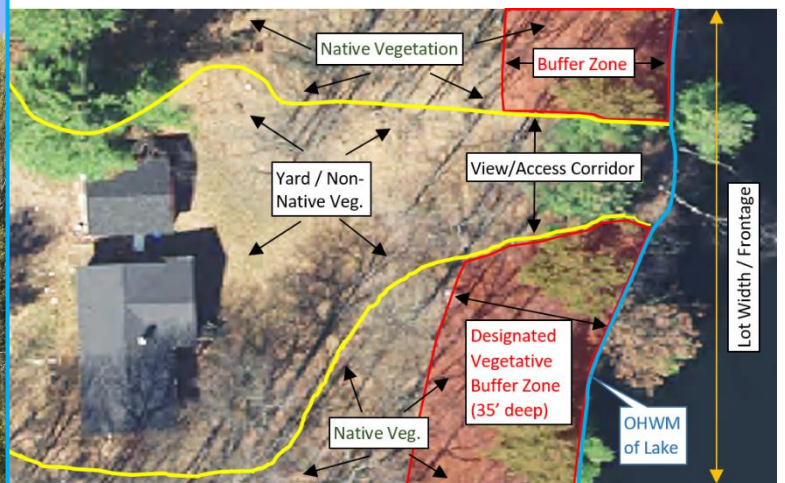


Figure 4: Aerial photo example of a 35' buffer zone.



Figure 5 (upper left): View from cabin of a vegetative buffer with 15 foot wide view/access corridor (County photo)
 Figures 6, 7, & 8 (upper right; lower left & right): Restoring a buffer zone with native plants (UW-Extension Lakes)

(4) Viewing and Access Corridor width of 15 feet or less

Intent: The purpose of the corridor is to concentrate human activity such as pedestrian traffic within one area, which can involve construction of a stairway or walkway if necessary for gaining access to the waterbody and also to allow a filtered view of the waterbody. Having a narrower viewing corridor means the vegetative buffer zone is larger, which provides for even more effective filtration of stormwater runoff moving downhill towards the waterbody, more near-shore habitat for wildlife, and natural screening between the structures on the lot and the waterbody.

Points earned: 1 mitigation point

Description/Requirements: As briefly mentioned in Option # 2, each lot is allowed to have a viewing and access corridor that passes through the vegetative buffer zone. Unlike in the vegetative buffer zone, more vegetation removal is allowed within the viewing and access corridor. The standard width that a viewing and access corridor can be is 35% of the width of lot/water frontage. In order to earn 1 mitigation point, the viewing and access corridor must be 15 feet or less in width and the lot must have a vegetative buffer zone that extends at least 15 feet landward from the OHWM of the waterbody. An existing 15 foot wide viewing corridor can be preserved, or a wider corridor can be reduced down to 15 feet by restoring/replanting the necessary area of vegetative buffer, which must be done in accordance with the standards contained in the USDA – Natural Resource Conservation Service (NRCS) guidance document [Wisconsin Biology Technical Note # 1 – Shoreland Habitat](#). Vegetation removal and maintenance within the vegetative buffer zone must be in accordance with Section 17.41(6) of the Barron County Land Use Ordinance.

- Website link to *Wisconsin Biology Technical Note # 1 – Shoreland Habitat*:
<https://dnr.wi.gov/topic/ShorelandZoning/documents/NRCSBioTechNote.pdf>
- Native Plant List (WI DNR) website link: <https://dnr.wi.gov/files/pdf/pubs/nh/nh0936.pdf>

(5) Install a rock-filled infiltration trench or pit

Intent: Capturing stormwater in an infiltration device lessens the amount of polluted runoff that would otherwise flow across the land downhill and enter the nearby waterbody, which has negative impacts on water quality and near-shore aquatic habitat.

Points earned: Up to 3 mitigation points: If the infiltration device is designed to treat at least the amount of impervious surface area that is being added in the proposed construction project, 3 mitigation points can be earned. In cases where the proposed construction project involves less than 200 square feet of additional impervious surface, the infiltration device must be sized and designed to treat at least 200 square feet of impervious area, which will earn 3 mitigation points.

Description/Requirements: Digging, installing, and maintaining a rock-filled infiltration trench or pit is an effective way to capture stormwater runoff carrying pollutants and allows the water to filter through the soil and recharge the groundwater. The sizing, location, materials, and other specifications for a rock infiltration trench or pit shall follow design standards contained in the Burnett County Land and Water Conservation Department publication [*Controlling Runoff and Erosion from Your Waterfront Property – A Guide for Landowners*](#) copyright 2008.

- Website link to *Controlling Runoff and Erosion from Your Waterfront Property – A Guide for Landowners*: <http://www.burnettcounty.com/DocumentCenter/Home/View/119> (section on infiltration starts on page 19)



Figure 10 (above): Rock trench under drip line of garage with slab foundation. (UW-Extension Lakes)

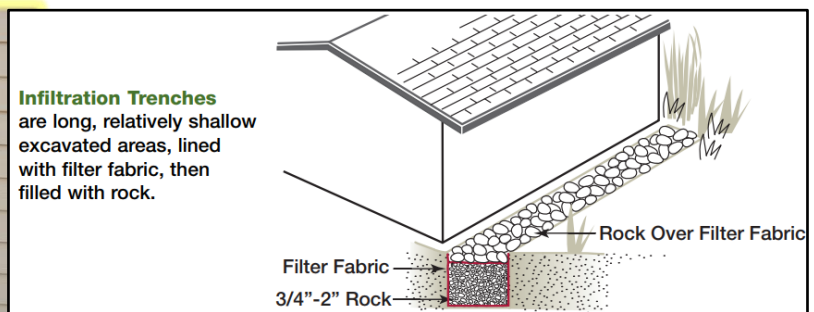


Figure 9: Illustration of rock trench.
(*Controlling Runoff and Erosion from Your Waterfront Property*)

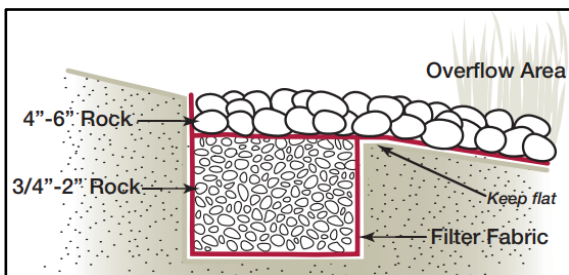


Figure 11 (above): Side view illustration of a rock pit
(*Controlling Runoff and Erosion from Your Waterfront Property*)



Figures 12, 13, & 14 (right): Stages of installing a rock infiltration pit.
Excavate the pit; line with filter fabric; finished by covering with rock,
more fabric, and top layer of larger rock.
(Balsam Lake Protection & Rehabilitation District)

(6) Install a rain garden with native plantings, or similar feature

Intent: Capturing the stormwater in a rain garden lessens the amount of polluted runoff that would otherwise flow across the land downhill and enter the nearby waterbody, which has negative impacts on water quality and near-shore aquatic habitat.

Points earned: Up to 3 mitigation points: If the rain garden is designed to treat at least the amount of impervious surface area that is being added in the proposed construction project, 3 mitigation points can be earned. In cases where the proposed construction project involves less than 200 square feet of additional impervious surface, the rain garden must be sized and designed to treat at least 200 square feet of impervious area, which will earn 3 mitigation points.

Description/Requirements: Digging, installing, and maintaining a rain garden is an effective way to capture stormwater runoff carrying pollutants and allows the water to filter through the soil and plant roots which then recharges the groundwater. A rain garden is a shallow depression in a yard area that has a flat bottom, which is designed to have stormwater from an impervious surface directed towards it, and is planted with native plants. Native plants have much deeper roots than lawn grass, which provides for much more effective filtration of pollutants and higher capacity for water absorption. Native plantings also provide habitat for many types of birds and butterflies. The sizing, location, materials, and other specifications for a rain garden shall follow design standards contained in the WI Standards Oversight Council & WI DNR publication [Rain Gardens: A Guide for Homeowners & Landscapers](#).

- Website links to *Rain Gardens: A Guide for Homeowners & Landscapers*:
High quality publishing version: <https://dnr.wi.gov/topic/Stormwater/documents/RainGardenManual.pdf>
Printer friendly version: <https://dnr.wi.gov/topic/Stormwater/documents/RainGardenManualPrint.pdf>
- UW-Extension Lakes, Rain Garden resources: <https://www.uwsp.edu/cnr-ap/UWEXLakes/Pages/ecology/shoreland/raingardens.aspx>



Figure 16 (above): Rain garden in full sun.

Figure 17 (below): Rain garden in part shade.
(*Rain Gardens for Lake Ripley Watershed*)



Figure 15 (below): Features of a rain garden and how it works.
(Beckley Sanitary Board)

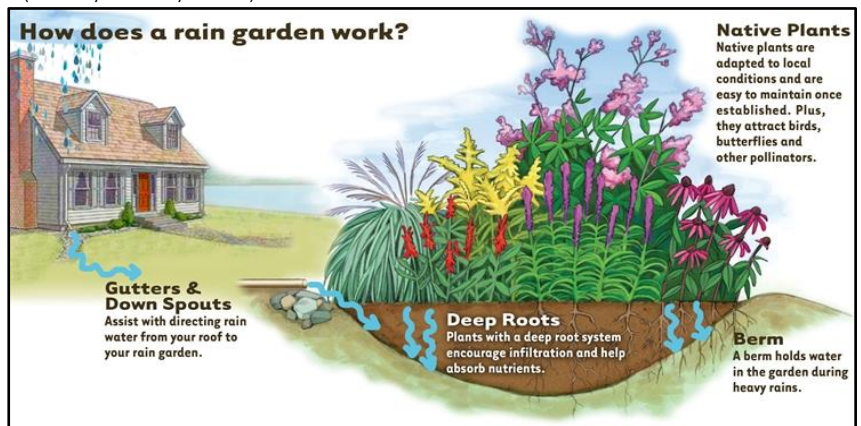
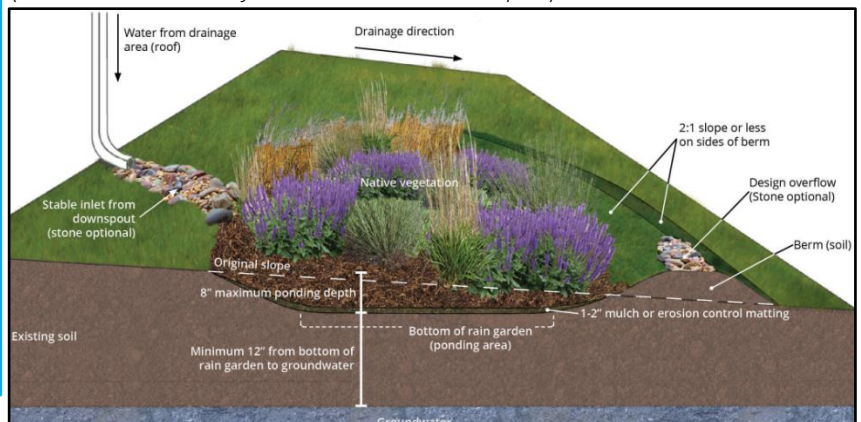


Figure 18 (below): Graphic of some rain garden design standards.
(*Rain Gardens: A Guide for Homeowners & Landscapers*)



(7) Preserve or restore both shoreland sideyard areas with native plants

Intent: Whether it is restoring or just preserving, a shoreland sideyard vegetation buffer can slow down stormwater and filter out pollutants that are carried in the stormwater after a rainfall and allow it to seep into the ground, rather than flowing over the land and into the nearby waterbody which negatively impacts water quality and near-shore aquatic habitat.

Points earned: 1 mitigation point

Description/Requirements: The shoreland sideyard areas extend 10 feet into the lot and run along each side lot line. There are 2 sideyards on a typical lot. For the purposes of this mitigation practice, a shoreland sideyard area is 10 feet in width and the depth starts at a point 35 feet landward from the ordinary high water mark (OHWM) of the waterbody and extends to a point 75 feet from the OHWM, which runs parallel to the side lot line. In order to receive 1 mitigation point, an existing compliant buffer can be preserved, or if there is not a compliant buffer on the lot currently, it can be restored/replanted. When determining if an existing buffer is sufficient or when restoring/replanting a vegetative buffer, it shall be in accordance with the standards contained in the USDA – Natural Resource Conservation Service (NRCS) guidance document [Wisconsin Biology Technical Note # 1 – Shoreland Habitat](https://dnr.wi.gov/topic/ShorelandZoning/documents/NRCSBioTechNote.pdf). In general, the vegetation within the buffer must be left untouched, with the exception routine maintenance and removal of invasive/non-native species, diseased vegetation, vegetation causing an imminent safety hazard, provided that any vegetation removed is replaced by replanting in the same area as soon as practicable.

- Website link to *Wisconsin Biology Technical Note # 1 – Shoreland Habitat*: <https://dnr.wi.gov/topic/ShorelandZoning/documents/NRCSBioTechNote.pdf>
- Native Plant List (WI DNR) website link: <https://dnr.wi.gov/files/pdf/pubs/nh/nh0936.pdf>



Figure 19: Aerial photo example of shoreland sideyards on a lakefront lot.

(8) Remove or relocate a building or impervious structure, which is located within the shoreland setback, to a compliant location

Intent: Removing a structure from the shoreland setback area (within 75 feet of the ordinary high water mark of a waterbody) is a good way to restore the natural scenic beauty of the shoreland area and reduce the amount of impervious surfaces in close proximity to the waterbody. Buildings and other impervious surfaces located near the waterbody means there is little or no vegetative buffer to filter out pollutants that are carried in the stormwater runoff coming from those impervious surface before entering the waterbody.

Points earned: 1 point for each structure

Description/Requirements: 1 mitigation point will be earned for each building or other impervious surface that is removed/relocated out of the shoreland setback area. Zoning staff will determine whether the building or surface qualifies for receiving mitigation points for its removal/relocation. The footprint area of the building or surface must be restored, revegetated, and stabilized appropriately after removal. Additional requirements include:

- (a) Structures removed/relocated from the vegetative buffer zone (within 35 feet of the OHWM and outside the allowable viewing corridor).
 - 1. The footprint location shall be restored and revegetated with native plantings and a plan for such restoration shall be created following the standards contained in USDA – Natural Resource Conservation Service (NRCS) guidance document [*Wisconsin Biology Technical Note # 1 – Shoreland Habitat*](#).
 - 2. A site plan shall be drawn which depicts the current location of the structure including measurements from the OHWM, lot lines, septic system, roadways, etc.
- (b) Structures being relocated.
 - 1. The relocated structure shall comply with all size, density, location, and use standards of the Barron County Land Use Ordinance.
 - 2. A site plan shall be drawn which depicts the current and new location of the structure including measurements from the OHWM, lot lines, septic system, roadways, etc.
 - 3. All necessary Land Use Permits must be obtained prior to relocation.

- Website link to *Wisconsin Biology Technical Note # 1 – Shoreland Habitat*:
<https://dnr.wi.gov/topic/ShorelandZoning/documents/NRCSBioTechNote.pdf>

Figures 20 & 21: A boathouse or shed located in close proximity to a waterbody is a prime candidate for removal to clean up the shoreline and earn mitigation credit.

(County photos)

